

# FlightScope PRO

Powered by EDH Tracking 



Golf Club Comparison  
and  
Calibration System

## User Manual

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E62-MR400 Issue 2

## Introduction

**Congratulations** on your purchase of the new EDH **FlightScope Pro** Golf Comparison and Calibration System.

With EDH FlightScope, you will learn about how you hit golf balls, using information previously only available to a few professionals.

Here are a few examples of what you can do with FlightScope:

- ① Calibrate each of your golf clubs, under varying conditions.
- ② Know the distance, grouping, and shot type you play with each club.
- ③ Compare yourself to your friends and other players including the top professional golfers.
- ④ Watch your progress.

You will therefore be able to go out onto the course knowing your yardage and shot making capabilities, under most conditions. This leads inevitably to better scoring and enjoyment of the game.



## Getting Started - Installation

Before FlightScope can be used, the Sensor and other hardware and software need to be installed.

### Components

Your FlightScope system comprises several items that require installation.

The components to be installed are:



Optional items: Sensor protective cover,  
Notebook Computer, with operating system  
Printer

The Computer connects to the Sensor by means of the communications cable.

## Equipment Installation

The installation is a very important step to achieve the best results from your FlightScope system, and is best carried out by a qualified FlightScope installer.

Installation requirements and procedures are described in the FlightScope Pro Installation Manual (E62-GP054 Issue 1).

## Installing the FlightScope Pro Software

### Prerequisites for the Software Installation

- ① Laptop, notebook, or desktop Computer with:
  - Pentium 3 or later processor or equivalent
  - 256 Mbyte memory
  - CD ROM drive
  - Microsoft Windows 2000, XP Home, or XP Pro
- ② FlightScope Pro installation software on CD.

### Software Installation Procedure

- ① Switch Computer on and wait for operating system to startup.
- ② Insert FlightScope CD into CD ROM drive. The installation software will start automatically.
- ③ Follow the steps and instructions provided by the installation software. Accept the "default" option if unsure about any selection.
- ④ Once the installation is complete, remove the CD from the Computer and store in a safe place.
- ⑤ If the default options were selected, the FlightScope Pro software will be available as an Icon on the Computer's Windows Desktop.

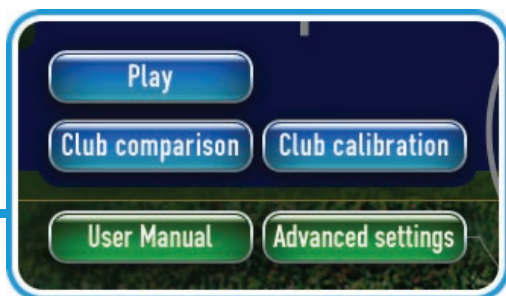
## Operation

### Daily Start-up

The FlightScope Pro system has been designed with “ease of use” in mind.

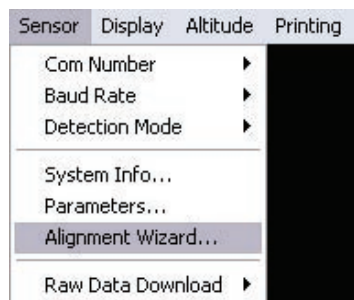
Also remember that help is just a phone call away.

- ❶ Ensure that the sensor power is switched on. (The sensor can stay permanently powered on)
- ❷ Place the Computer in a location within 4-5 metres from the Sensor and connect the Communications Cable (9 pin D connector) to the Sensor and the Computer com: port.
- ❸ Start up the Computer
- ❹ Double click the FlightScope Pro icon on the desktop.
- ❺ Click OK to start.
- ❻ Wait for Main screen of FlightScope Pro:  
The following selections are available:
  - Play
  - Club Comparison
  - Club Calibration
  - User Manual
  - Advanced Settings



## Alignment Wizard

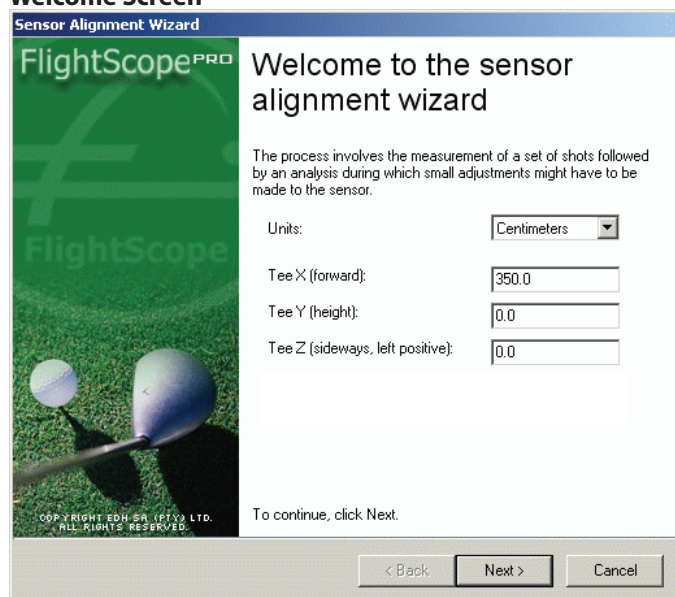
The alignment wizard is available from the Sensor Advanced menu.



The Latest FlightScope sensors have a slightly different setup procedure compared to older versions. The FlightScope software will automatically detect your sensor and display the appropriate setup procedure. Both are described in the following pages.

### NEW VERSION

#### Welcome Screen



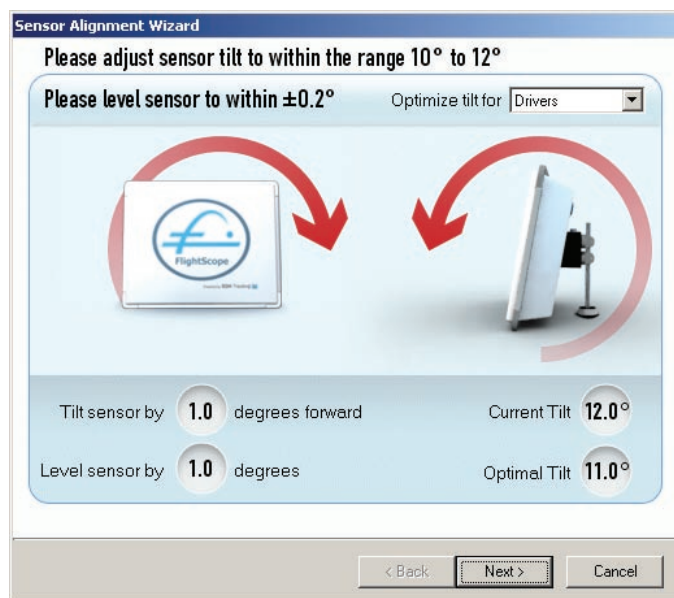
On the first screen of the alignment wizard you can initialize your tee position relative to the radar and set your sensor tilt. The tilt value should never need to be adjusted, but the tee X, Y and Z value can be changed to match your setup as follows:

- X** is the distance from the front of the sensor to the tee position.  
**Y** is the distance from floor height to the tee height.  
**Z** is the offset from the line that represents the view direction of the sensor, left (when facing the green / flag) being positive.

Measurements can be specified in either centimeters or inches depending on the option selected in the dropdown list.

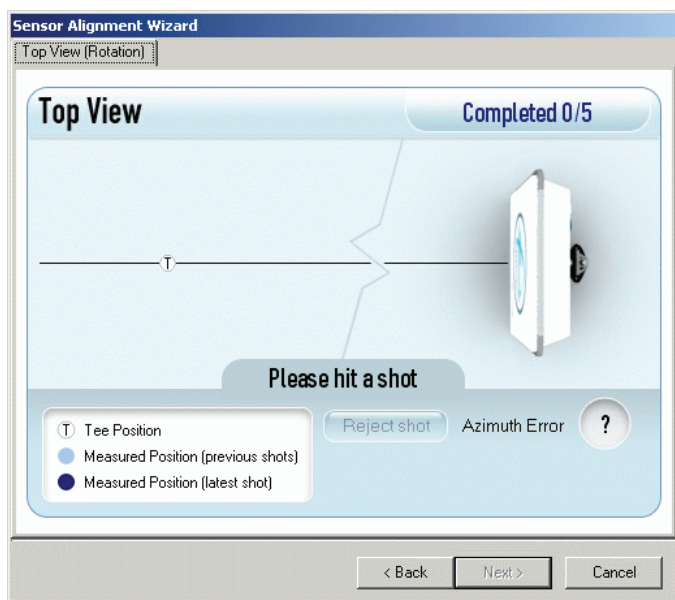
### Tilt / Level Screen

(If you do not see this screen then you have an older sensor. Please turn to p10 which describes the alignment procedure for older sensors.)



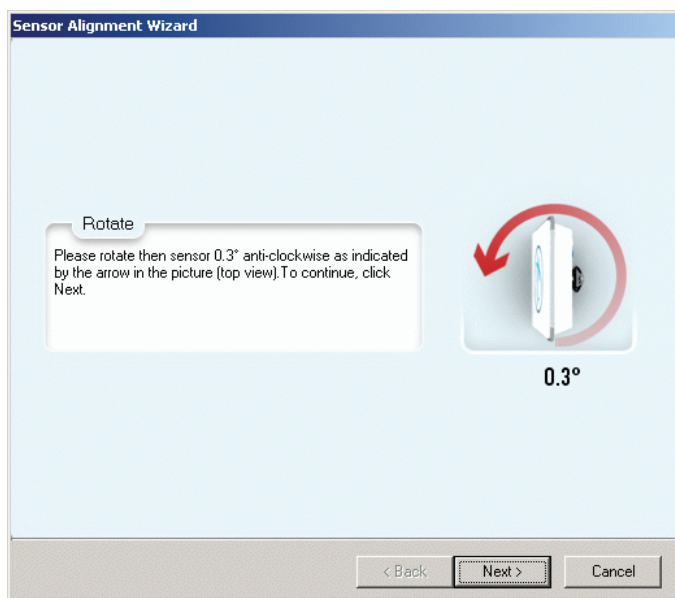
The Tilt angle of the sensor needs to be adjusted to fall within the recommended range as is optimal for the selected club type.

The Roll angle of the sensor should be adjusted to be as close to zero as possible.



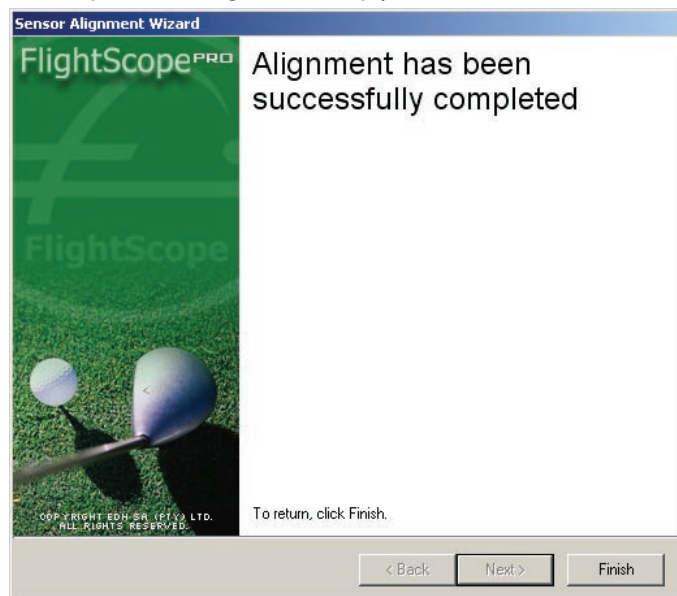
After clicking **Next** when enough shots have been recorded, the Rotate screen is displayed. Instructions are given on how the sensor should be rotated if necessary for proper alignment.

### Rotate Screen



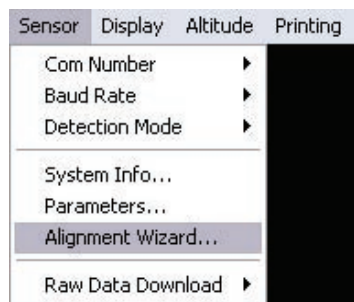


To complete the alignment simply click “Finish”.

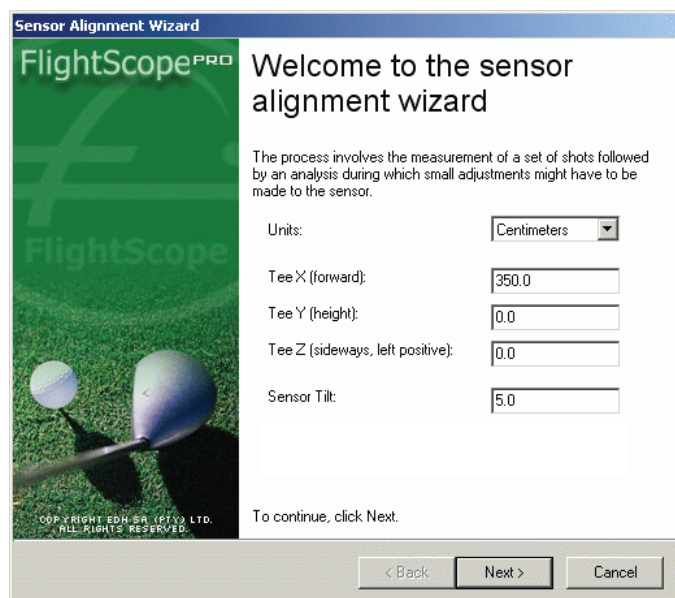


## Alignment Wizard (older sensors)

The alignment wizard is available from the Sensor Advanced menu.



### Welcome Screen



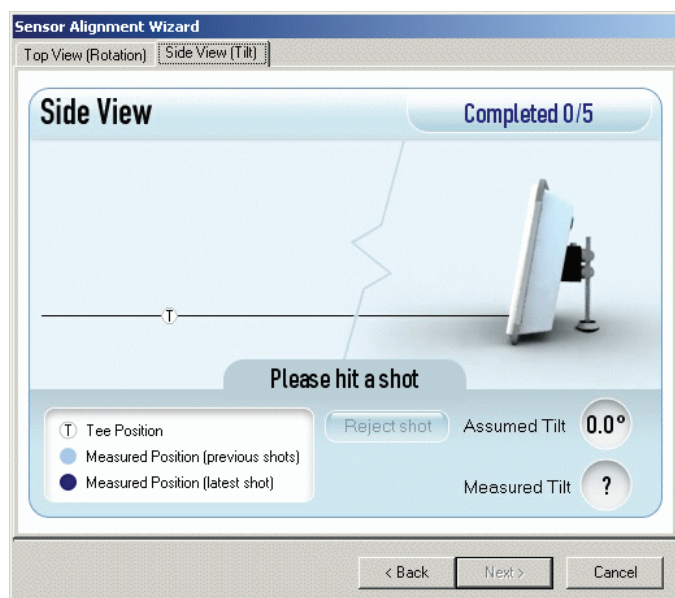
On the first screen of the alignment wizard you can initialize your tee position relative to the radar and set your sensor tilt. The tilt value should never need to be adjusted, but the tee X, Y and Z value can be changed to match your setup as follows:

- X** is the distance from the front of the sensor to the tee position.  
**Y** is the distance from floor height to the tee height.  
**Z** is the offset from the line that represents the view direction of the sensor, left (when facing the green / flag) being positive.

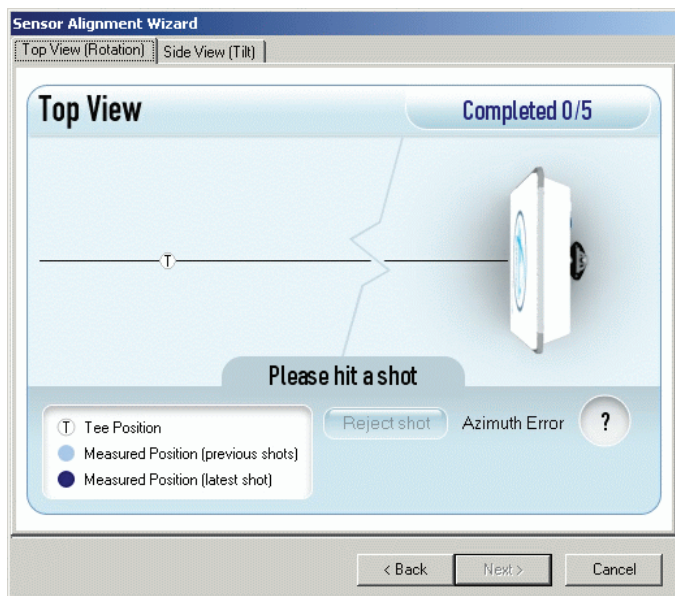
Measurements can be specified in either centimeters or inches depending on the option selected in the dropdown list.

## Main Screen

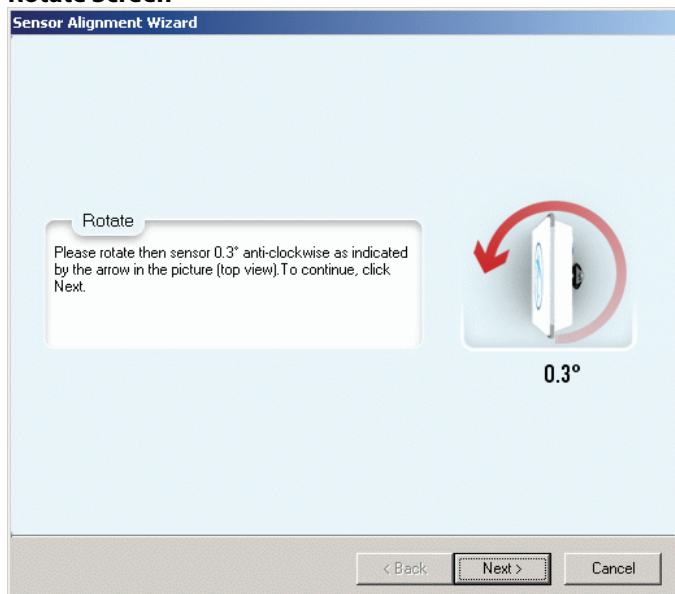
The main screen in the alignment wizard allows you to hit a number of shots (typically 3 to 5 shots with a 6 iron) that will tell FlightScope whether or not your sensor is aligned.



While the system is activated and ready to record your shots, two views are available: side view and top view. The side view will show you information about the assumed and average measured tilt angles, whereas the top view will show you any offset measured in azimuth (rotation) angle. Once some shots have been recorded, you can cancel them in reverse order (latest first) by clicking on the **Reject Shot** button if they were not satisfactory.



## Rotate Screen



After clicking **Next** when enough shots have been recorded, the Rotate screen is displayed. Instructions are given on how the sensor should be rotated if necessary for proper alignment.

## Tilt Screen

The Tilt screen gives suggestions as to how the sensor needs to be tilted. Two options are usually available: the sensor can be tilted to match what the tilt angle it is currently assumed to be at or it can be notified what tilt it is physically at.

There is, however, an optimal tilt angle for the sensor and the quality of analysis can decrease if the true tilt angle deviates too much from this. Therefore it is most often suggested that the sensor be tilted physically in order to correct any tilt offset.

The two options are given as two choices selectable by check boxes. The recommended choice is automatically selected by default.

The screenshot shows the 'Sensor Alignment Wizard' window. At the top, it displays 'Tilt Parameter' as 5.0° and 'Measured Tilt' as 4.6°. Below this, there are two choices. Choice 1 is unselected and contains text explaining that the software sets the tilt parameter to the measured value of 4.6° and a note that this is not recommended for measured tilt outside the 10.5° to 13.5° range. Choice 2 is selected with a checkmark and contains text instructing the user to tilt the sensor 0.4° backward as indicated by an arrow in a side-view picture. To the right of the text for Choice 2 is a diagram of a sensor on a stand with a red curved arrow indicating a 0.4° backward tilt. At the bottom of the window are three buttons: '< Back', 'Next >', and 'Cancel'.

To complete the alignment simply click "Finish".

The screenshot shows the 'Sensor Alignment Wizard' window with a green background on the left side featuring the FlightScope logo and a golf club. The main text area says 'Alignment has been successfully completed'. Below this, it says 'To return, click Finish.' At the bottom of the window are three buttons: '< Back', 'Next >', and 'Finish'.



# Play

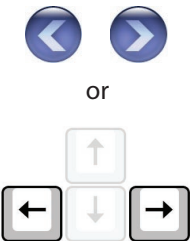
The system may be left in this mode for general use.



Shots will be measured and displayed as they are played. Various tabular and graphic displays of shot results 3D can be viewed by using the clickable navigation buttons or the left and right keyboard buttons.

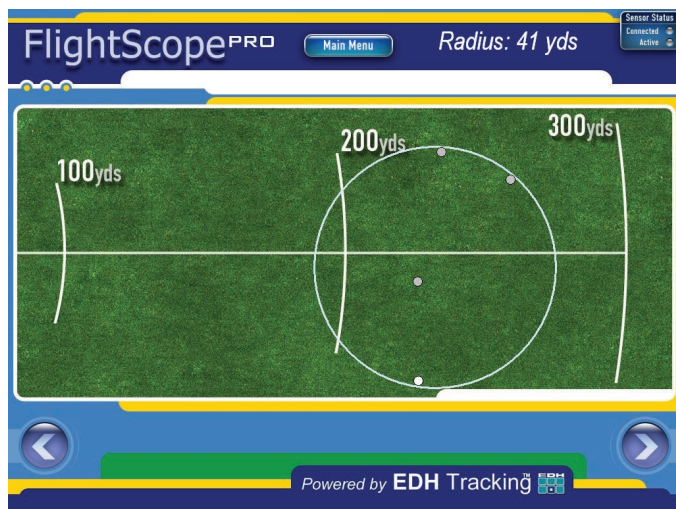
## 3D View

Flight paths in three-dimensional graphic view:



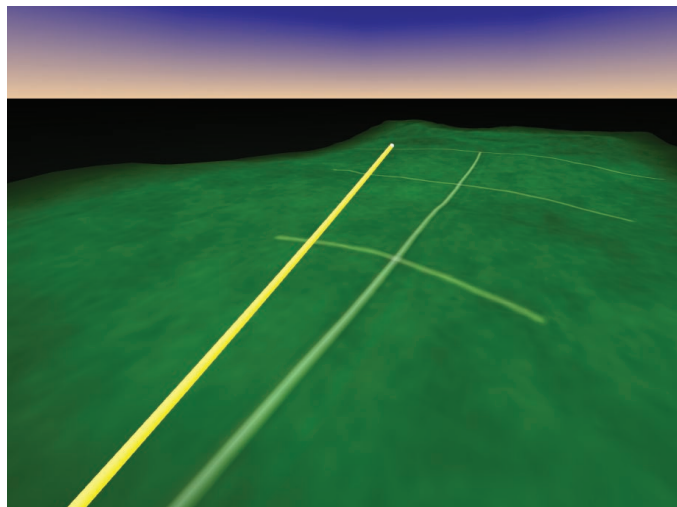
## Grouping View

Top view of grouping of ball landing position and grouping radius:



## 3D Camera View

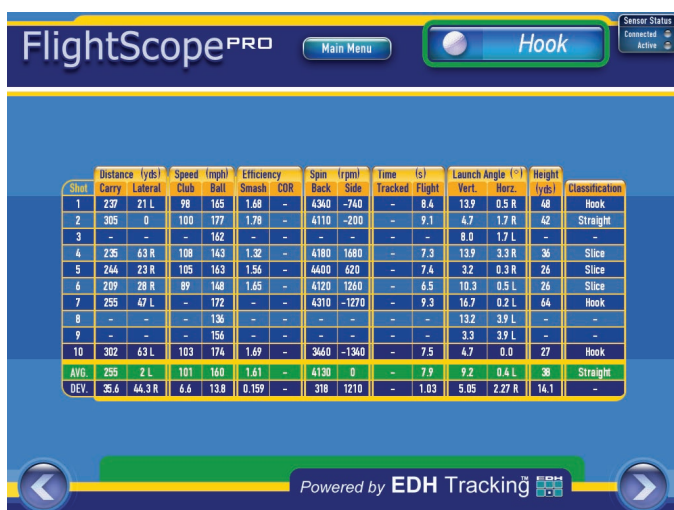
By pressing the **spacebar** at any stage, a 3D real-time trajectory will be displayed of the last played shot.



## Table View

The table contents are arranged in the following groups:

- Distance: Carry & Lateral
- Speed: Club & Ball
- Efficiency: Smash & COR
- Spin: Back & Side
- Time: Tracked & Flight
- Launch Angle: Vertical & Horizontal
- Height
- Classification.



Shot	Distance (yds)		Speed (mph)		Efficiency		Spin (rpm)		Time (s)		Launch Angle (°)		Height (yds)	Classification
	Carry	Lateral	Club	Ball	Smash	COR	Back	Side	Tracked	Flight	Vert.	Horz.		
1	237	21 L	98	165	1.68	-	4360	-748	-	8.4	13.9	0.5 R	48	Hook
2	305	0	100	177	1.78	-	4110	-200	-	9.1	4.7	1.7 R	42	Straight
3	-	-	-	162	-	-	-	-	-	-	8.0	1.7 L	-	-
4	235	63 R	108	143	1.32	-	4180	1680	-	7.3	13.9	3.3 R	36	Slice
5	244	23 R	105	163	1.56	-	4400	620	-	7.4	3.2	0.3 R	26	Slice
6	209	28 R	89	148	1.65	-	4120	1260	-	6.5	10.3	0.5 L	26	Slice
7	255	47 L	-	172	-	-	4310	-1270	-	9.3	16.7	0.2 L	64	Hook
8	-	-	-	136	-	-	-	-	-	-	13.2	3.9 L	-	-
9	-	-	-	156	-	-	-	-	-	-	3.3	3.9 L	-	-
10	302	63 L	103	174	1.69	-	3460	-1340	-	7.5	4.7	0.0	27	Hook
Avg.	295	2 L	101	160	1.61	-	4130	0	-	7.9	9.2	0.4 L	38	Straight
Dev.	35.6	44.3 R	6.6	13.8	0.159	-	318	1210	-	1.03	5.05	2.27 R	14.1	-

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## Club Comparison

Click on **Club Comparison**. The following screen will appear:

The screenshot shows the 'Club Comparison Centre' interface. At the top, it says 'FlightScope PRO EDH Sport'. Below that, the date 'May 20, 2005' is displayed. The 'Client Information' section has a dropdown menu for 'Name' with 'Henri Johnson' selected and a 'Load info' button. A 'Main Menu' button is also visible. On the right, there is a 'Sensor Status' indicator showing 'Connected' and 'Active'. The main area is titled 'Clubs to be compared' and contains a table with 5 rows. The first row is highlighted in yellow. Below the table are 'Clear session data' and 'Continue' buttons. At the bottom right, it says 'Powered by EDH Tracking'.

Clubs to be compared	
Club 1	My 1st club
Club 2	My 2nd club
Club 3	My 3rd club
Club 4	My 4th club
Club 5	My 5th club

Enter Surname and first names of client/player. (This will be used as a key for future data retrieval). Enter brands/shaft types/lofts of clubs to be fitted in the section provided "Clubs 1-5".

Click on **Continue**

## Playing Shots

The system is now ready to record shots.

**HINT:** Check that club displayed at the top corresponds with the club played.

Each shot's results will be displayed in the Table on the screen. Each shot can either be accepted (included) or rejected (excluded).

**FlightScope PRO™** **EDH Sport**

**CLUB COMPARISON CENTRE** May 20, 2005

**Client Information**  
Name: Henri Johnson

**Current Shot Data**

Carry Distance (yds)	Club Speed (mph)	Ball Speed (mph)	Smash	Azimuth (°)
245	89	147	1.65	0.2 R

L Angle (°)	Height (yds)	Flight time (s)	Back spin (rpm)	Classification
14.7	49	8.6	4760	Straight

**My 1st club**

Shot	Carry	Lateral	Club	Ball	Height (yds)	Classification
1	271	6 L	115	156	44	Straight
2	227	15 L	85	136	27	Draw
3	249	29 R	87	137	29	Slice
4	282	30 R	128	170	85	Fade
5	228	1 L	120	161	66	Straight
6	227	8 R	100	161	35	Slice
7	197	15 R	87	138	38	Straight
8	278	10 R	120	170	92	Straight
9	230	43 L	90	140	19	Hook
10	245	6 L	89	147	48	Straight
AVG.	243	2 R	102	151	48	Straight
DEV.	27.0	21.8	16.8	13.6	24.9	-

**Accept** **Reject**

Clear club data View all results Edit Clubs Next Club

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Accepted shot data will be saved to Computer file. As many shots can be played as wished per club.

Select following club or scroll between clubs using **Next Club**.

**FlightScope PRO™** **EDH Sport**

**CLUB COMPARISON CENTRE** May 20, 2005

**Client Information**  
Name: Henri Johnson

**My 2nd club**

Shot	Carry	Lateral	Club	Ball	Efficiency	Smash	CDR	Spin Back (rpm)	Side	Time Tracked (s)	Flight	Launch Angle (°)	Vert. Horiz.	Height (yds)	Classification
1	308	97 R	94	165	1.74	-	4490	1350	-	9.1	3.8	3.9 R	42	Push / Slice	
2	289	50 R	113	170	1.51	-	3730	1020	-	8.0	8.2	1.0 R	36	Slice	
3	192	1 L	77	137	1.77	-	4510	-170	-	5.7	5.5	0.8 R	15	Straight	
4	230	47 L	91	146	1.61	-	4300	-1620	-	8.1	17.1	0.7 R	47	Hook	
5	258	54 R	135	176	1.31	-	4150	1040	-	8.3	9.0	3.2 R	43	Slice	
6															
7															
8															
9															
10															
AVG.	257	31 R	102	159	1.59	-	4230	320	-	7.8	8.7	1.9 R	37	Fade	
DEV.	45.3	55.3	22.4	16.6	0.191	-	320	1233	-	1.30	5.12	1.51	12.6	-	

Clear club data View all results Edit Clubs Next Club

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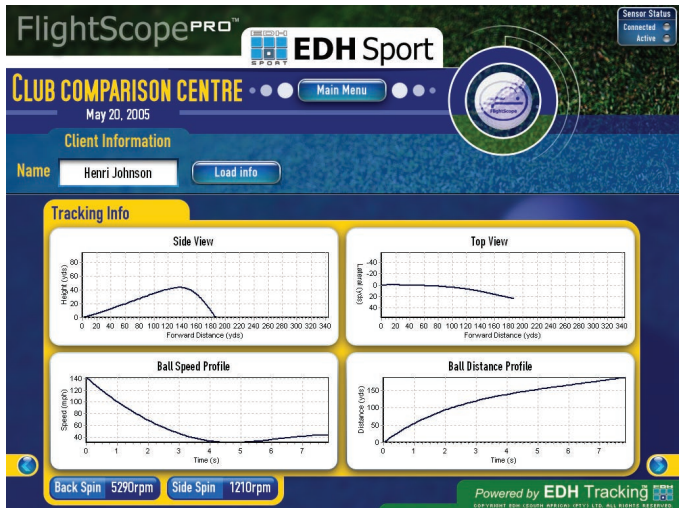
The “Results” screen can be viewed at any time by clicking on **View all results**.



On the “Results” page you can rate your clubs according to various criteria and print all your results.

Click **Resume** to return to Comparison.

As with the “Play” module, you can scroll between shot data, shot grouping, 3d, 3d camera, tracking info and club analysis screens simply by using the clickable navigation buttons or the left and right keyboard buttons.

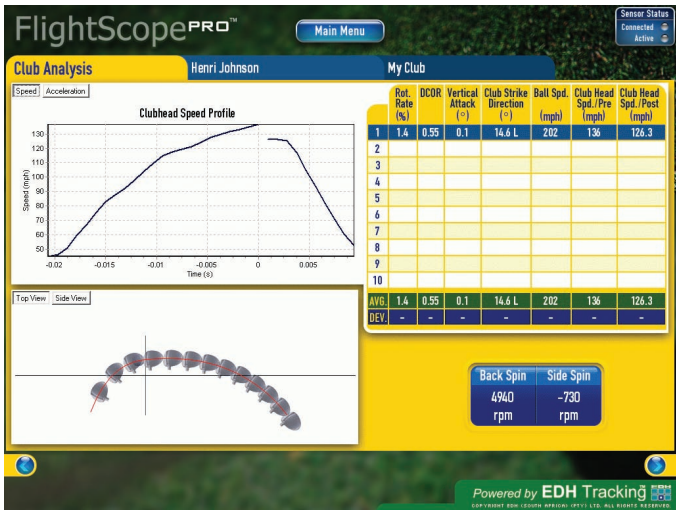


The “Tracking Info” screen will display a graphical view of the shot flight profile.

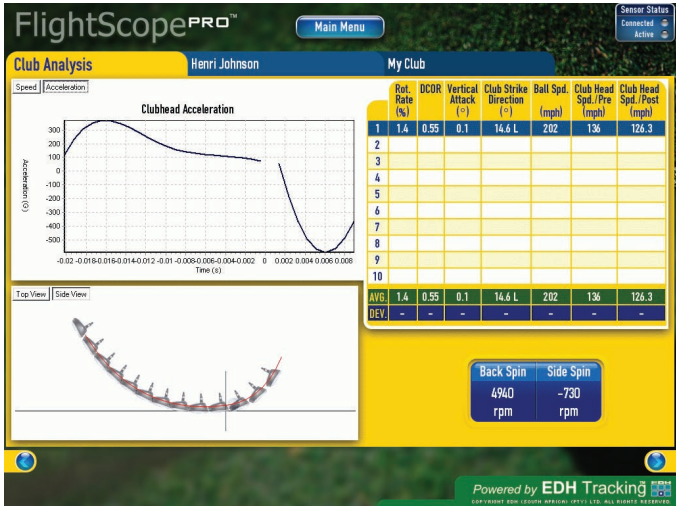
New to version 4 is the “Club Analysis” and “Ball Trajectory” screens.

For Club Analysis, two views are presented:

(a) Clubhead Speed Profile and



(b) Clubhead Acceleration Profile.

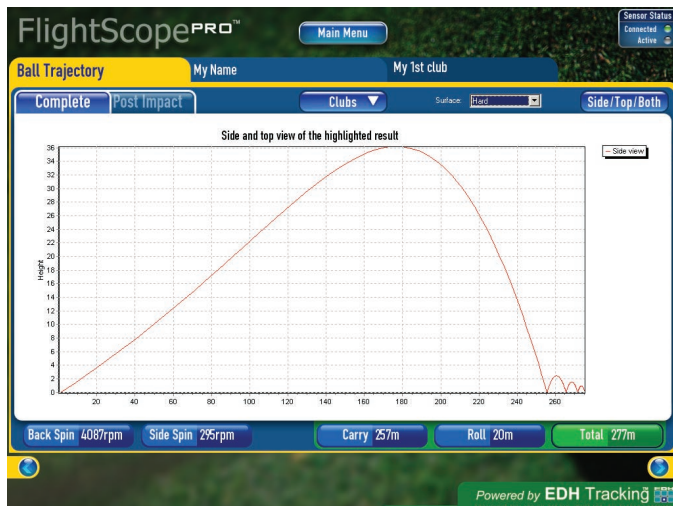


Rotational Rate:

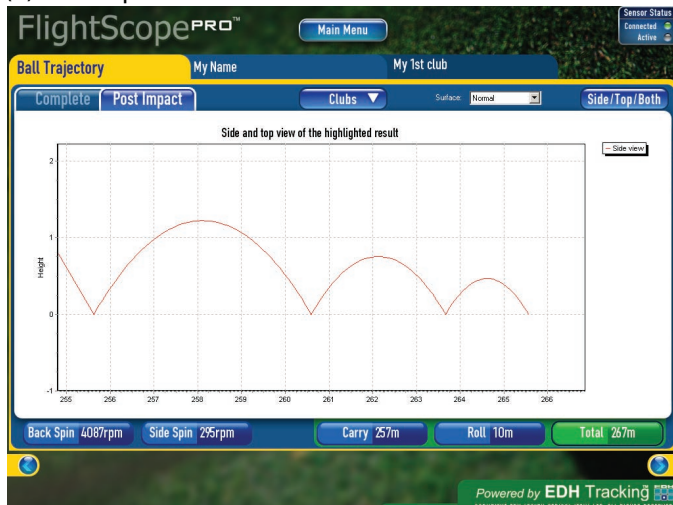
By measuring the club head speed, not only as an average speed prior to impact, but as a high definition speed profile through impact, it is now possible to determine the effective rotational rate created by a player about 2/1000's of a second prior to impact. Correct shaft fitting is now easier than ever before.

For Ball Trajectory, two views are presented:

(a) Complete trajectory and



(b) Post Impact.



Roll indicates the the post impact area of the ball or the entire trajectory of a single result or set of results.



# Club Calibration

Click **Club Calibration** on the Main screen.

The following screen will appear:



Enter Surname and first names of client/player. (This will be used as a key for future data retrieval with **Load info**).

Enter various clubs to be measured in the section provided. Up to 10 clubs may be entered.

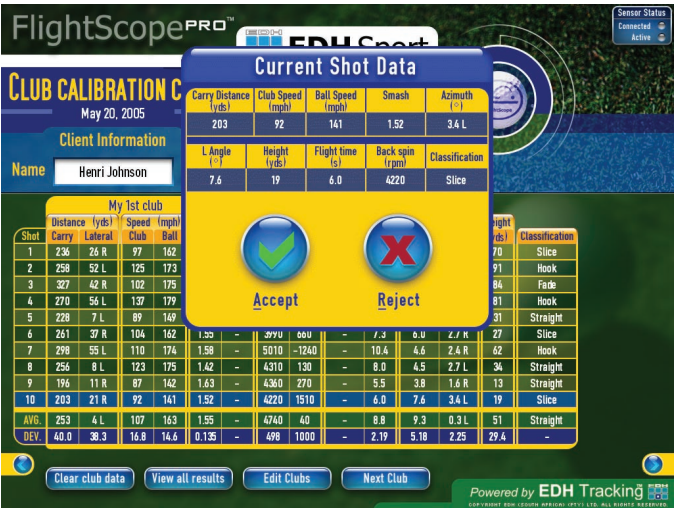
Click **Continue** to proceed.

## Playing Shots

The system is now ready to record shots.

HINT: Check that club displayed at the top corresponds with the club played.

Each shot's results will be displayed in the Table on the screen.



Each shot can either be accepted (included) or rejected (excluded).

Accepted shot data is saved to computer file. As many shots can be played as wished.

“Club Calibration” functions the same as “Club Comparison”. You can scroll between shot data, shot grouping, 3d, 3d camera and tracking info screens simply by using the clickable navigation buttons or the left and right keyboard buttons.

Select **Next Club** to proceed to the next club or to scroll between clubs.



The “Results” screen can be viewed at any time by clicking on **View all results**.



On the “Results” page you can rate your clubs according to various criteria and print all your results.

Click **Resume** to return to Calibration.



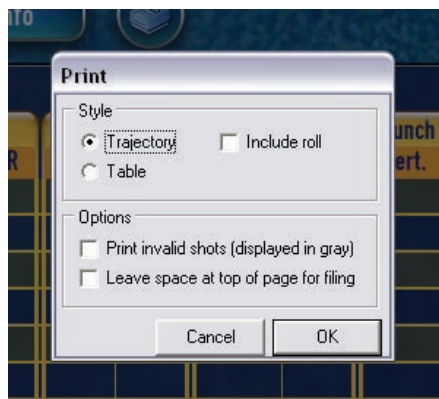
## Printing a report

A report can be printed from any session. Historical sessions that have been saved can also be recalled and printed.

Reports can be printed from the “Results” screen of FlightScope Pro, or after a **Load info** has been performed on saved data.

To print, proceed as follows:

- 1 Ensure that your printer is connected to the Computer, is switched on, and has sufficient paper for printing.
- 2 Check that the data on the screen represents the data you wish to print (player name, date, etc.)
- 3 Click on the Printer icon.
- 4 Select “Trajectory” or “Table” printing from the popup\*
- 5 Wait for the printer to complete printing.
- 6 Continue



# FlightScope<sup>PRO</sup> Report

for Gideon Zuurmond on August 25, 2005

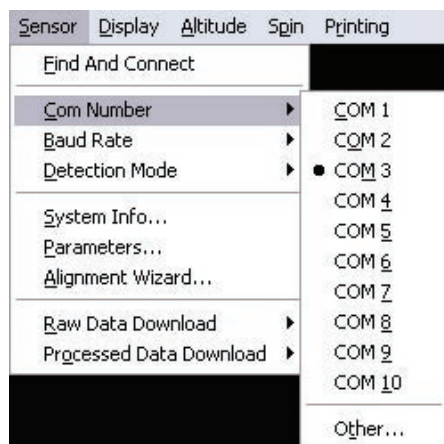
Shot	Club	Distance		Speed		Efficiency	Spin		Time	Launch Angle		Height	Classification	
		Total	Carry	Club Head	Ball Head		Swing	Back		Side	Vertical			Horizontal
1	DR	20.1	45	40	1.46	-	4882	706	5.9	7.5	15.9	27.1	36	pull/into
2	DR	7.9	20	42	1.16	-	4631	-439	5.1	4.5	4.1	0.21	7	draw
3	DR	32.8	48	74	1.52	-	4638	-1020	6.5	8.6	13.8	23.8	48	draw
4	DR	42.1	68	78	1.58	-	3982	1777	6.7	1.5	16.1	28.1	42	draw
5	DR	38.8	37	67	1.49	-	5106	-1425	6.9	8.2	10.3	27.1	38	hook
6	DR	26.1	40	71	1.85	-	4202	407	7.1	1.6	12.2	24.1	34	straight
Avg	DR	14.1	41	67	1.42	-	5112	19	6.6	7.9	12.2	15.1	41	straight
DEV	DR	26.8	6.9	6.8	0.107	-	789.6	1222.6	1.32	2.34	4.31	2.41.8	10.7	-

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Example of Printed Report

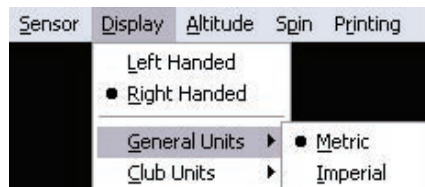
## Advanced Settings

The **Advanced Settings** button on the Main screen allows the setting of the measurement units as either Imperial or Metric standard. This menu can also be shown at any time by pressing the F10 key.



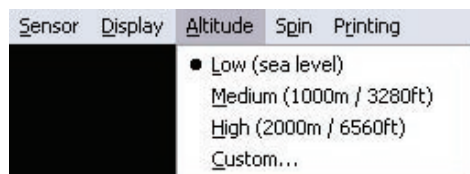
### Com Number

The COM number of the serial port on which the tracking sensor is connected can be adjusted by selecting the appropriate port from the Com Number submenu of the Sensor advanced menu.



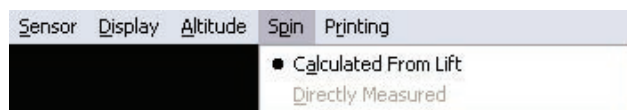
### Units

Club units may be set independent from all the other parameters as golfers often prefer to measure clubhead speed in miles per hour while other measurements may be in metric format.

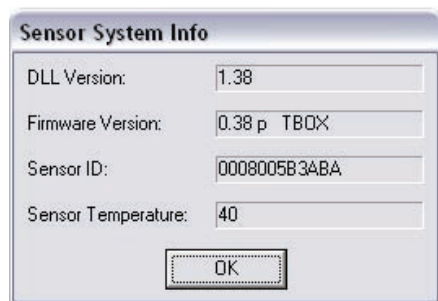


### Altitude

Altitude may be adjusted according to the height above sea level. At locations higher than 1000m (3281ft) above sea level the high altitude option is recommended. Depending on the type of tracking sensor used, this setting may or may not be adjustable.

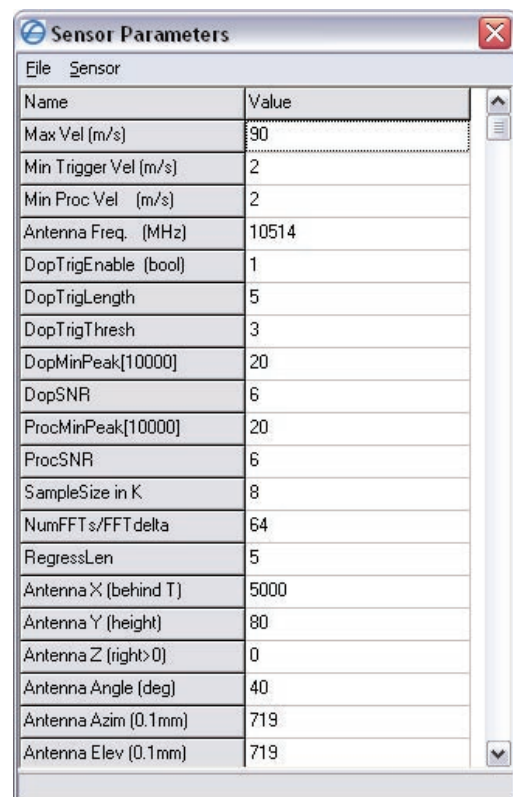


## System Info



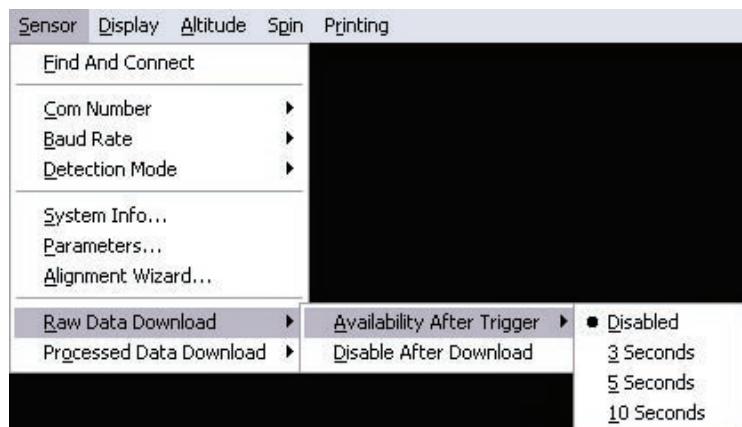
The System Info submenu feature, available in the Sensor advanced menu, gives technical information about the tracking sensor and software.

## Tracking Parameters



Some of the technical parameters used in the tracking process can be adjusted in the Sensor Parameters window, accessible from the Sensor Parameters item in the Sensor advanced menu. These parameters should never be modified unless specifically instructed by EDH Sport technical support.

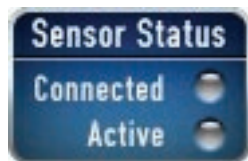
## Raw Data Download



Raw tracking samples can be downloaded from the sensor and saved for advanced technical diagnostics. Not required during normal use.

## Sensor Status

The diagnostic status of Sensor is displayed in the upper right hand corner of the Main screen:



The **Connected** indicator shows the status of the data communications connection between the Computer and the Sensor. This indicator should be constantly “green”.

The **Active** indicator shows when the Sensor is measuring. The software controls the Sensor measurement, so that this status will change during operation and use.

## User Manual

To access, click the User Manual button on the Main Screen menu.

## Definition of Measured Parameters

**Carry Distance** : Distance in a straight line from the tee-off spot to where the golf ball touches the ground again. Roll excluded.

**Clubhead Speed** : The club speed at the point of impact.

**Ball Speed** : Speed of the golf ball at the start of flight, in the direction of flight.

**Smash** : This is a factor of shot efficiency. It provides a very good idea of how sweetly the ball was struck. Even on perfect shots, the Smash depends on factors such as balls used, coefficient of restitution of the club, and loft.

**HINT:** The process allows the fitter to wait for acknowledgment from the client on a good shot on a specific club, before proceeding and accepting following shots that have the same or better Smash results (higher value). When changing to the next club, the process is repeated.

**Azimuth** : Azimuth angle is the angle, in the horizontal plane, at which the ball travels from the tee point. Positive angles are to the right (clockwise) and negative angles are to the left (counter-clockwise).

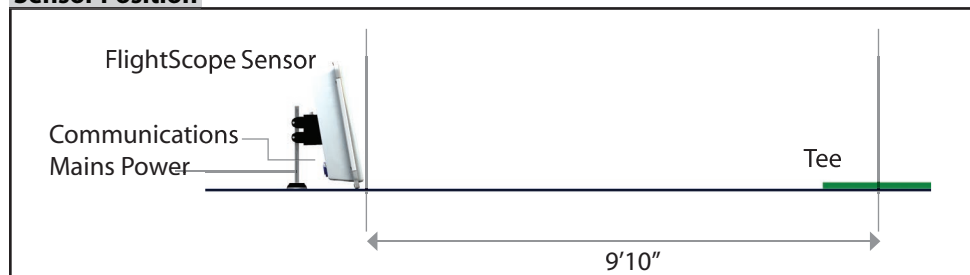
**Launch Angle** : The launch angle is the angle at which the ball travels from the tee-off point from the horizontal plane.

**Height** : The maximum height that the ball reaches in its flight path.

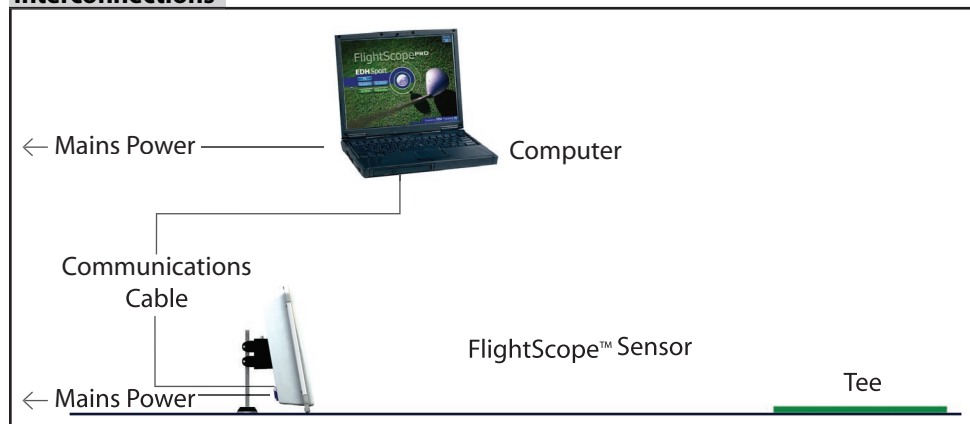
**Classification** : The classification of the shot is made based on the measured trajectory direction and curvature of the flight path.

## Diagrams

### Sensor Position



### Interconnections



## Specifications

### Physical Characteristics

- Dimensions (approximate)
- 330 x 460 x 305 mm (13 x 7 x 12 in) HeightxWidthxDepth
- Mass (approximate)
- Sensor 3 kg (6.6 lbs)
- Cables & Accessories 3 kg (6.6lbs)

### Environmental Characteristics

- Ambient Temperature
- Operates between 0 to 40 °C (32 to 104 °F)
- Ingress Protection Level
- IP54 / NEMA-4.

### Electrical Characteristics

- Electrical Supply: 100-260 Volt AC @ 0.5 Amp
- Communications Interface: RS422/RS232 serial interface, at up to 115 kbps Certified to FCC, CE and Industry Canada requirements.

## Appendix

### Electrical Power Requirements

The owner of the equipment is responsible for providing the appropriate mains electrical power supply for the installation of FlightScope.

#### Positions

Mains electrical power supply need to be provided at the following points:

- a.Sensor mounting position
- b.Computer position

#### Voltage

The supply shall be 95-264 Vac, 50/60 Hz.

#### Current

The maximum current requirement at each point is 5 A.

#### Circuit Breaker

The Sensor power point and the Computer power point must be fed via a circuit breaker.

#### Sensor Power Outlet/Connection

The sensor power point may be either a standard outlet socket or a screw terminal connector block in an approved junction box.

If permanently installed in an unprotected outdoors location, the power installation must have an acceptable health and safety rating for exposed environments (BS7671 or equivalent).

The outlet should be switched.

#### Earthing

In all cases, an earth connection shall be provided in addition to the live and neutral circuits.

#### Qualified Contractors and Materials

All electrical cabling shall be installed by qualified electrical contractors using methods and materials that satisfy local safety and regulatory standards.

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